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Citizens' Bulletin

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Commissioner
Stanley J. Pac

Director Info & Ed
William Delaney

Editor
Margot Callahan

Graphics
Rosemary Gutbrod

Composition
Audrey Verrengia

Circulation
Helen Moriarty - 566-5524

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Conserving the State's heritage focus of report

"Connecticut is renowned for its very high quality of life. Surveys of officers of corporations that have moved to Connecticut cite as a major reason for moving here the State's artistic and cultural resources, its rich and varied natural setting, and the omnipresent sense of history. The result, as we all are aware, is a uniquely attractive state in which to live and work.

"But the forces of change press around us, drawing us into the larger mold of regional and national life. The result can be the loss, by a subtle incremental process, of those qualities that have made Connecticut the place it is."

So begins the Report of the Governor's Task Force for the Preservation of the Heritage of Connecticut. On February 9, at a luncheon meeting at the Old State House in Hartford, Task Force chairman Terry J. Tondro formally presented the report to Governor William O'Neill and Senate Majority Leader Richard F. Schneller.

The Task Force's report includes a total of 43 recommendations in the areas of resource identification, education and public awareness, contributions by minority groups, acquisition and management of heritage resources, support for cultural efforts, the State's role in conserving heritage resources, protection of privately owned resources, municipal involvement in the preservation process, technical assistance, formation of historical districts, and the establishment of a continuing Advisory Council on Heritage Resources.

Special Act 80-76, signed into law by Governor Ella Grass[illegible] on May 29, 1980, created the Governor's Task Force for the Preservation of the Heritage of Connecticut. The legislation established a 25-member task force to develop policy recommendations concerning the protection and preservation of Connecticut's historical, cultural, and natural resources.

The group, whose members are representatives of private organizations whose major responsibility is the preservation

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"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

Terry J. Tondro, right, presented Heritage Report to State Senator Richard Schneller and Governor William O'Neill.

Gypsy moth control--
less is more!

By Robert L. Garrepy, State Forester

If you can, learn to live with gypsy moths. In general, that is the advice of foresters and entomologists.

The infestation prognosis for the spring of 1982 varies with location. Western Connecticut, which suffered badly in 1981, should see much improved conditions this year. Mass starvation of caterpillars and an effective natural virus disease combined to reduce the gypsy moth population drastically. The eastern part of the state, largely spared in 1981, can expect much worse conditions in 1982. To complicate matters, local conditions from town to town, or even acre to acre, could vary widely.

There's a reason for the geographical progress of the problem. Gypsy moths in the smallest of their five or six stages, or "instars," spread for the most part on the wind. Small caterpillars may be carried several miles per day. Prevailing winds in Connecticut blow from west to east, so infestations also tend to move from west to east.

The impact of the gypsy moth is substantial but very difficult to evaluate. The nuisance caused by thousands of caterpillars is readily apparent to those who have had to put up with them. The loss of valuable shade and ornamental trees and shrubs around houses may result in a direct financial cost to home owners. Defoliation of maturing forest stands can lead to substantial financial losses for woodland owners. So the gypsy moth is no longer just an aesthetic problem.

Can you tell if you are going to have a gypsy moth problem next summer? Probably. Count egg masses any time up to mid-April. The Connecticut Agricultural Experiment Station's "Frontiers of Plant Science" issue on "The Gypsy Moth" described their method:

> By our survey (5 minutes of counting), the presence of 150 or more large (1 1/4 x 3/4 inches) egg masses per acre of forest supporting an abundance (50 percent of the leaf area) of favored trees usually indicates a pending outbreak.

If you need to spray, now is already past the prime time to hire an applicator -- it may be too late because of the limited numbers of licensed arborists in the State.

When to spray

Best time to apply insecticide is, according to the "Frontiers" article: "1) after all larvae have hatched, 2) after most larvae have settled down to feed and have ceased being blown by the wind, and 3) before the caterpillars have fed excessively on the leaves. This period usually occurs between mid-May and mid-June."

Monitoring the hatch is easy, says State Entomologist John Anderson. Just observe the masses on your trees, starting in late April. The young caterpillars do not leave the egg mass immediately, and you should be able to see them when they emerge. There may be several hundred to a thousand caterpillars from a single egg mass.

Gypsy moths are not the only spring season defoliators. In 1970, for example, the elm spanworm did some of the damage blamed on the gypsy moth. (The elm spanworm has since been controlled by a tiny egg parasite discovered by Agricultural Experiment Station scientists.)

Are there trees in your future?

Research by the Connecticut Agricultural Experiment Station indicates that gypsy moth defoliation has no more than doubled the normal tree mortality in hardwood stands. However, gypsy moth outbreaks appear to speed up the natural process of forest succession. In other words, gypsy moth defoliation will not destroy a forest, but may have significant long-term effects on it.

Even repeated defoliations rarely kill hardwood trees directly. After defoliation, healthy hardwoods produce a second set of leaves, drawing on almost all the trees' stored food reserves. Refoliation means the trees have only a short period to devote to food production. Thus two or three years of defoliation weaken a tree, making it more susceptible to other pests, especially the two-lined chestnut borer and a root rot disease. City trees, already subject to the stresses of air pollution and soil compaction, may suffer more from insect defoliation than their country cousins.

As was mentioned, Experiment Station studies indicate gypsy moths cause a doubling of natural mortality in forest stands. Some foresters feel this estimate is very conservative. There is little disagreement, however, that the gypsy moth's favorite food species, oak, is hardest hit. Unfortunately, the largest and most valuable oaks in a stand are usually those most susceptible to the gypsy moth. The greater the percentage of oaks in a stand the greater the amount of mortality. Birches, maples, tulip-poplar, and ash, resistant to gypsy moth defoliation, often replace the oaks that die, leading to long-term changes in forest composition.

Softwoods -- pine, hemlock, spruce, and other conifers -- are usually killed by a complete defoliation. Because softwood trees hold needles for two or three years, their ability to refoliate is severely limited. Once stripped they are usually gone. In western Connecticut hemlock mortality from the 1981 gypsy moth epidemic was locally severe. In the eastern part of the state, where white pine grows with oaks and other hardwoods, extensive softwood losses are anticipated.

What you can do . . . though you may not want to

Approaches to dealing with the gypsy moth problem are varied, and all have limitations. They include:

*Roadside or ground application of pesticides

*Aerial spraying of pesticides

*Vegetation management

*Predators and parasites

*Search and destroy missions

*Lures and traps

Roadside spraying

Some communities have tried roadside spraying -- but the success level has been questionable. In 1981, DEP's Forestry Unit sprayed about 110 acres in the most heavily-used State recreation areas from the ground with the chemical carbaryl in a water solution. Our conclusion was that this type of control was not effective. The spraying protected these areas -- reaching 50 to 75 feet from the roadside -- for a short period of time. But then the caterpillars just moved in from the surrounding woodland.

Ground spraying

Ground spraying is similar to roadside treatment except it is expanded to include trees that can be reached by truck-mounted equipment regardless of location. This method of control is most common in Connecticut. In 1981 it cost from $50 to $100 to treat an average house lot if an applicator was available.

Effective insecticide application requires thorough tree coverage. For tall shade trees, 60 to 80 feet in height, only the specialized pumping equipment owned by licensed commercial applicators can do the job correctly.

Timing of the application is also critical -- too early will not affect late hatching caterpillars; too late will kill the insects but not save the leaves.

Either the biological insecticide Bt (Bacillus thuringiensus) or chemicals -- including methoxychlor, Sevin, Imidan, and Orthene -- or combinations of these are used. (Viral controls are still in the testing stages.) Two applications of Bt are generally needed. Malathion, while not registered for gypsy moths, may be used to control other insects and is effective on gypsy moths at the same time. Ground application generally uses more pesticide than aerial spraying would.

Aerial spraying

DEP's regulations restrict the aerial application of broad-spectrum chemical pesticides to agricultural purposes only. Agency policy has limited aerial spray permits to traditional agricultural crops, nurseries, and Christmas tree plantations, excluding woodland treatment. Bt may be applied from the air so long as permit requirements are met. The minimum area is 10 acres, and each land owner or tenant within the spray area and buffer zone must provide written consent to be treated.

To further complicate matters, Bt is relatively expensive -- applications cost $25 to $30 per acre in 1981 -- and it requires two applications, seven to 10 days apart. Assuming all spray permit conditions are met, that an applicator is available, and that weather conditions are favorable, Bt may reduce the caterpillar population enough to protect the trees, but will leave a number of survivors more than adequate to sustain a population for the following year.

Gypsy moths that survive a spraying usually find living conditions ideal -- little competition for available food and too few insects to sustain a population of predators or carry over a disease epidemic. In fact, spraying appears to perpetuate the problem. In untreated areas, the caterpillar population expands until conditions cause starvation or are favorable to disease and parasite infestations. Eventually, natural controls are effective, but human discomfort and the loss of trees are interim effects.

Much research is being conducted in efforts to improve the effectiveness of biological control measures. In 1981, some 600 acres of the Cockaponsett State Forest were treated with both a Bt formulation and another viral disease material called Gypchek. Another study conducted by the Connecticut Agricultural Experiment Station on State and private lands in Harwinton compared results of several strains of Bt. While final test evaluations are not yet complete, it is obvious that biological agents may provide varying degrees of foliage protection, but they do not reduce the caterpillar populations to levels that would eliminate the nuisance factor to people.

Is there any help?

The U.S.D.A. Forest Service sponsors a cooperative cost-sharing program for gypsy moth control with emphasis on high-use, high-value forest areas. On the average, the federal share of project expenses is 48 percent. However, program guidelines emphasize aerial application of chemical materials and require considerable administrative control by the supervising state agency. For all practical purposes federal funding for gypsy moth control is unavailable to Connecticut.

State cost sharing with municipalities is allowed under the provisions of Section 12-81 of the General Statutes. While not mandatory, the Finance Advisory Committee may make funding available for reimbursement of up to 50 percent of a town's spray costs. In 1981, towns received a total of $32,500 in cost-sharing funds. A greater demand for financial assistance is anticipated in 1982.

Vegetation management

If there were no food supply, or if the foliage available was unattractive to gypsy moth caterpillars, there would be little or no pest population to bother us. Ultimately, vegetation control will be a key factor in reducing the occurrence of gypsy moth epidemics.

In the smaller instar stages, the caterpillars are very discriminating in their food selection. Conifer needles and many species of shrubs and hardwood trees will not be touched until the caterpillars reach a length of about one inch (third or fourth instar). The larger the caterpillar, the more likely it is to eat, or try to eat, any foliage. However, even mature insects will avoid certain species such as ash, mountain laurel, tulip-poplar, sycamore, and red cedar.

Home owners and forest managers, then, should modify vegetative cover to favor those plants and trees that are unattractive to gypsy moth caterpillars. Unfortunately, oaks, which are some of the most common, most beautiful, and most valuable shade tree species, are also a favored food of the gypsy moth.

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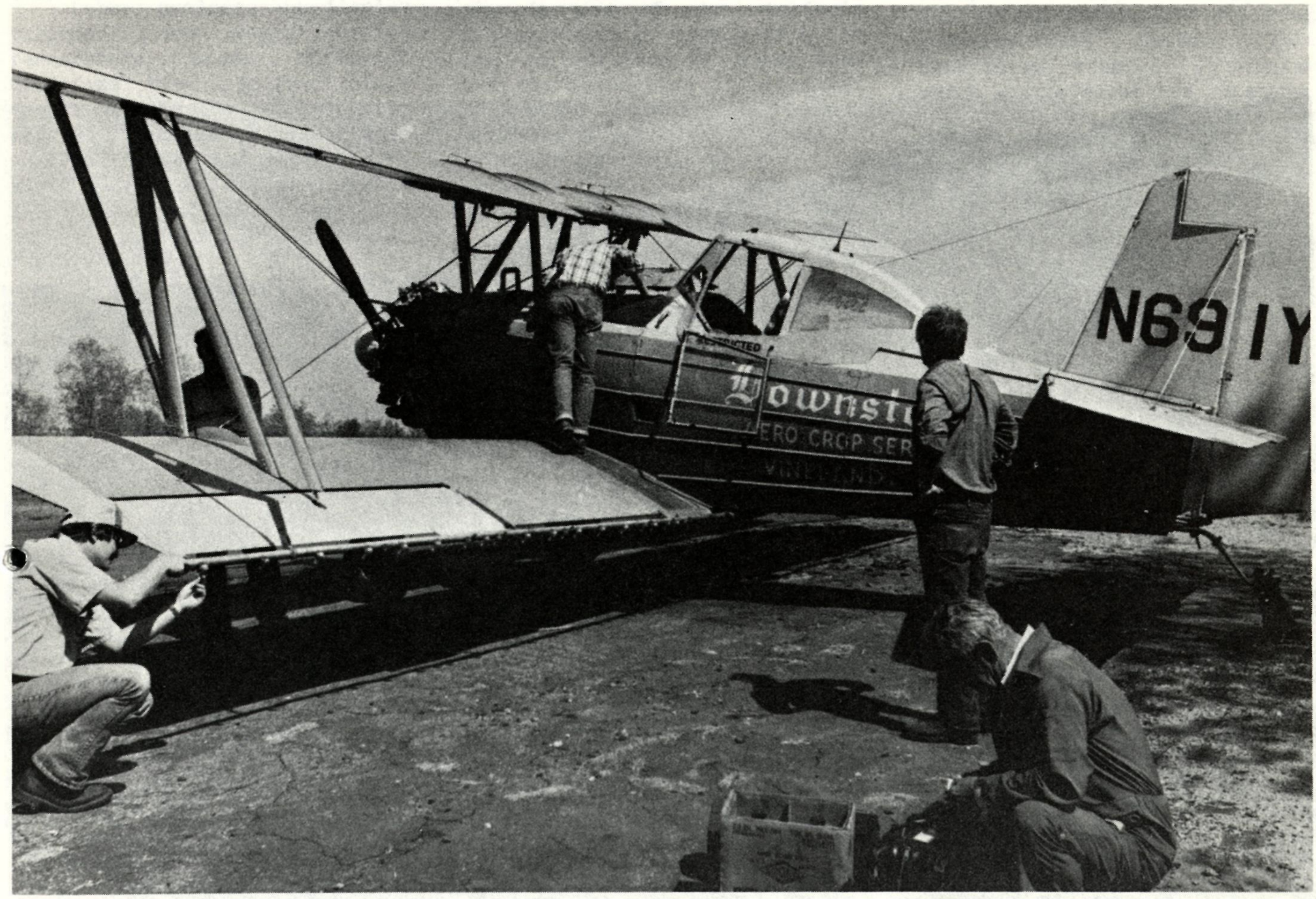
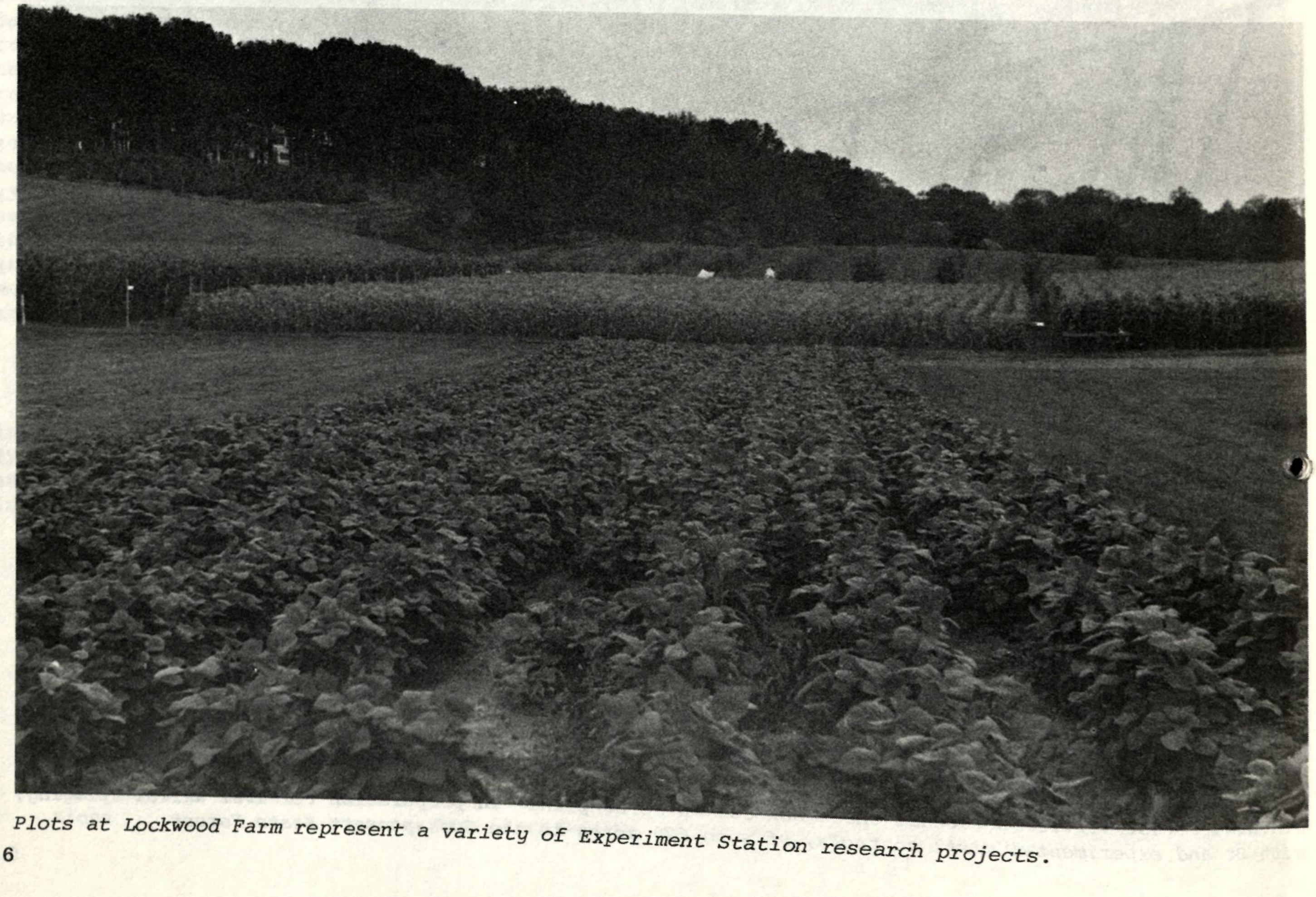


U.S.D.A. Forest Service personnel check nozzles on spray plane in preparation for 1981 aerial spraying, with Bt and experimental viral controls, of some 600 acres in the Cockaponsett State Forest.

Food production, natural resources . . .

major interests of Experiment Station researchers



Plots at Lockwood Farm represent a variety of Experiment Station research projects.

Seven-hundred-and-fifty to a thousand Connecticut citizens demonstrably know of the existence of the Connecticut Agricultural Experiment Station. They--college professors and industrial chemists as well as a healthy contigent of home gardeners--took advantage of 1981 Plant Science Day at the Station's Lockwood Farm in Mount Carmel.

Among the displays they looked over was one that included a cannon, a reproduction of an owl (with a starling in its claws), and a hawk silhouette on a transparent kite, supported by a helium-filled balloon. All of these had been tested as fear-provoking stimuli against birds in corn fields. (The kite got the best score. A chemical substance, supposed to confuse birds and cause them to drive away other birds with their warning calls, failed to have any effect at all.)

Other projects on display included plots where station researchers study different Christmas tree species; bluegrass and fescue grass varieties; mulches; herbicides; various table and wine grape varieties; and various wastes (pharmaceutical, mushroom farm, and sewage sludge) as fertilizers for corn.

At a small tobacco field which has been the site of an innovative investigation of whether superior photosythesis in plants results in higher crop yields, researchers showed the equipment they had developed for the tests.

Plant Science Day also included such special exhibits as a display of Connecticut weeds and a "problem booth" where visitors could ask questions on plant, bug, gardening, and related topics. But Plant Science Day's country-fair air does not, perhaps, do full justice to the Experiment Station and its role in the State.

Though this year's gypsy moth outbreak may have drawn it more than the usual attention, most of the time The Connecticut Agricultural Experiment Station quietly conducts its business out of the public eye. Yet its services to State regulatory agencies and its investigations of plant pests and related issues of economic importance to the State mean it effectively serves almost every citizen.

"We are," says Paul Waggoner, the director of the station, "researchers. That's our business. We're the State's only professional research outfit." This mission is different, Waggoner says, from that of the colleges and the Extension Service whose primary work is education and different from agencies whose major role is regulation.

Some of the station's research and related responsibilities are spelled out in the General Statutes. It is responsible for the official investigation and control of serious plant pests afflicting the State. The State Entomologist, who is one of the station's researchers, is responsible for the registration of honey bees and the inspection of hives for a disease called foul brood. There is a series of charges in relation to research into and control of the gypsy moth in the State. The station also registers nurserymen and inspects nursery stock. And it is one of several laboratories authorized to perform analytical tests in a variety of areas.

The Agricultural Experiment Station operates under a Board of Control consisting of the Governor, the Commissioner of Agriculture, and the station Director, who are ex officio members; two members appointed to three-year terms by the Governor; and one member each appointed by the Sheffield Scientific School (Yale Corporation), Wesleyan University, and the University of Connecticut Board of Trustees. "This Board," Waggoner says, "chooses the large projects the Experiment Station undertakes."

"For us to take up a problem," says Waggoner, "requires that 'three stars be in conjunction.' First, it has to be some problem of the State. Second, it has to be within the historical and practical scope of the station, or else it's too expensive and tends not to be very fruitful. We've never, for example, done sociological studies. Third, it must be a scientific, researchable problem--it must be 'do-able.' And, of course, we must also find an interested scientist to do the work."

Historically, two large areas are the station's particular interests. The first of these, Waggoner says, is research "to insure that the production of food is abundant, in the State and around the world." The second area, which claims about an equal share of the station's research resources, is the study of the State's natural resources--forests, soils, and water in particular.

The station is much what it is today by way of evolution. Early in the 19th century, when the United States was still an underdeveloped nation, Yale University started a program which sent some of its outstanding graduates to Europe for further study. One of these early travelers, Samuel W. Johnson, for whom the annual Plant Science Day's major lecture is named, came back from Germany with the idea of establishing what, in Germany, they called a Landwirtschaftlich Versuchsstation; literally translated, an Agricultural Experiment Station.

He succeeded, establishing the first agricultural experiment station in this country. It took him 20 years, however. Johnson eventually sold the idea to the Connecticut State Legislature on the basis, Waggoner says, of what today would be considered a "consumer protection issue," the problem of the adulteration of fertilizers. When it was established in 1875, the station took as its first project the chemical analysis of the fertilizers offered for sale in the State.

Today every State in the country has an Agricultural Experiment Station, and there is coordination of research projects of all the stations and the U.S. Department of Agriculture via a computer bank in Washington.

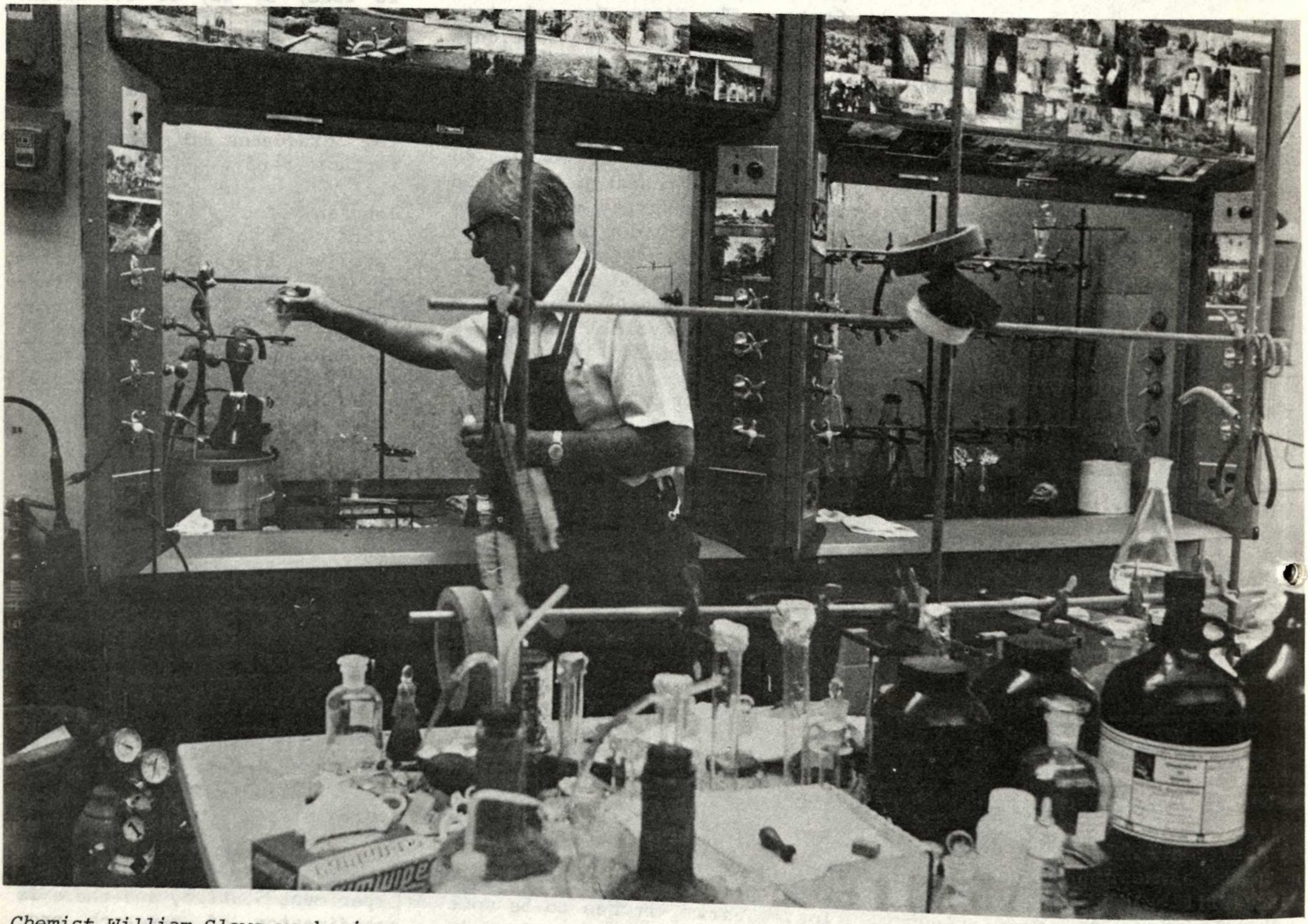
The Connecticut Agricultural Experiment Station's labs provide extensive support for State regulatory departments. "Consumer Protection, Environmental Protection, the Department of Agriculture--all of these depend on our analyses to carry on their businesses," Waggoner says. "We're the ones who determine 'if the hamburger isn't right,' for Consumer Protection, and what formulas make up various pesticides, for DEP's Pesticides Section. We determine if there are pesticides in milk or adulterations in animal feeds or if there are weed seeds in the garden seeds for the Department of Agriculture."

Among its "clients," Waggoner says that the DEP, with its needs for tests on surface water, ground water, landfill contamination, PCBs, pesticides, river movement, etc., probably runs second only to the general public in the amount of business it creates for the station.

"We have", he adds, "the best equipped and staffed analytical lab for environmental protection of any New England State, according to the federal Environmental Protection Agency. In the milieu of research, and in the development of new analytical methods, the Station is in a class by itself in New England." More than 8,000 samples are tested annually. Some tests are simple, but others are complex and it may take days to prepare the specimens for analysis.

The station's New Haven headquarters includes four laboratory buildings and five greenhouses, plus the station's oldest building which now serves as its library. In addition, the station runs the 65-acre Lockwood Farm and a laboratory and 13-acre farm in Windsor. The latter are needed because, Waggoner says, "The soils and water and agriculture of the Connecticut Valley are far afield from what we have here in New Haven." The station also has numerous experiments in State Forests and on private farms around the State.

The Experiment Station's staff of 113 includes about 40 scientists: biologists; entomologists; plant pathologists; biochemists; and geneticists. There are chemists: analytical and soil and water. There are physicists, whose expertise is needed for many of the problems such as how water (and pollutants like PCBs) moves down a river such as the Housatonic or how spores of plant pathogens are dispersed. There is a mathematician--to handle the



Chemist William Slowa works in one of Experiment Station's laboratories.

tough applied math required in problems such as dispersion models.

The Station's staff has remained about the same size for the last 50 years, but the directions of their research projects have changed with time. As Waggoner puts it, "We've evolved deliberately."

The manpower once involved with soil fertility testing has now moved into the study of the pollution of soil and ground waters. The group who once looked at contaminants in fertilizers now studies the movements of fertilizers, PCBs, benzene, chlorinated hydrocarbons, and other contaminants, in water.

The station is winding up its research on PCBs and "tooling up to study organic compounds in ground water, hand in glove with DEP." Since the current concern is with effects of very low concentrations of some of these substances, Waggoner says, "This study will require not only that we use the very best methods available but that we improve on them. It will take months for us to get out front in this area, to pioneer. . ."

Pioneering is nothing new. Over the years, the station has been responsible for the development of a number of new analytical methods and some major contributions to knowledge about food production. Among its accomplishments have been the development of hybrid corn, the development of the first organic compound for treating plant disease, and the development of the test for soil fertility.

The station has been studying the natural succesion of Connecticut forests for over half a century — one of the longest such studies in the nation. Early on, the station got into the study of forest pests--fungi and disease insects in particular. In recent years the station has, among other achievements, tested a systemic fungicide against Dutch elm disease--it's not widely used so far because it's expensive and difficult to diffuse through a big tree.

Station researchers have worked for 60 years on chestnut blight. "We're attempting to use a virus to kill the fungus that causes this disease. Right now we can cure any given canker," Waggoner explains, "but we can't yet cause the virus to spread naturally. If we could do that, this would be an exemplary biological control, solving a problem for which there was never any hope of a solution before."

Station entomologists have been looking at the gypsy moth ever since the turn of the century. They've performed major insecticide experiments during outbreaks--this year they tested the bacterial agent Bt (Bacillus thuringiensis) in Harwinton in cooperation with the DEP and the USDA. They have studied related issues like whether Bt delays maturation in those larvae not killed by the bacteria. They've done extensive investigations of parasites that prey on the gypsy moth. "We've investigated a large number of these parasites, and it's getting tougher to find new ones," Waggoner says, adding that improving relations with China may mean they can get some new predator candidates from Asia. Fifteen years ago researchers at the station developed a medium in which they could rear gypsy moths, meaning research could go on year round and not only during major gypsy moth outbreaks.

As far as serving the public need goes, Waggonner points out that one station researcher spends full time on projects related to effective and safe means of controlling weeds. Such an effort is economically important, he says, in a way that might not be apparent to the layman: "Most people probably don't realize it, but nursery materials--shrubs, bedding, house plants--are now the State's number one cash crop."

The station serves the public in smaller as well as larger ways. In 1978, the Legislature changed the State statutes to allow anyone who grows at least 51 percent of the grapes on his own property to make up to 75,000 gallons of wine. This gave one of the station's researchers the impetus to set up a plot to evaluate the success of different strains of wine grapes in Connecticut's climate. After several years, the research is beginning to produce some information about strains likely to be successful in this area. (Questioners at Plant Science Day wanted to get directly to the heart of the matter, asking: "What's the best tasting grape with no problems in the growing?")

The station makes its work available to the general public. Nearly 100 publications can be had on request on matters as diverse as screening children for lead poisoning, defoliation and mortality in forests, pests of nursery plants, household insect pests, weeds, food quality--reports on juice drinks, chip dips, yogurt--plant diseases, soils, etc.

During the height of this year's concern over the eating habits of the gypsy moth, the station distributed over 45,000 copies of its publications on the gypsy moth. And they answered questions. "Two people left other work and answered phones full time," Waggoner said. But, he adds, "This type of assignment consumes a small portion of time compared to research."

If nobody on the station staff has an answer, a question like "What effect did last Christmas's remarkably cold weather have on gypsy moths?" may lead to research. First, however, one of the scientists will consult the literature in the field. "It's the economical way. We have a major scientific library. The Yale Library is third or fourth in the country. If anything has been done, you usually can find an answer in New Haven." Station staff members do their research well, Waggoner emphasizes, because they don't want to duplicate work already done. "We have people here who plan to make scientific discoveries, and they're not going to come in second. In science there are no prizes for coming in second." ■

Gypsy moths

From page 5

Predators

The gypsy moth has about a dozen native or introduced enemies that act as predators. These include parasitic wasps, parasitic flies, large ground beetles, and some bird and small mammal species. The Connecticut Agricultural Experiment Station recently released two promising new insect parasites from Japan in northeastern and southwestern Connecticut, but they are not yet sure about their establishment. Many introduced predators fail to survive because of a lack of appropriate target insects between gypsy moth epidemics. Even the established predator populations undergo cycles that follow closely those of the gypsy moth; that is, their populations diminish as the gypsy moth food supplies decrease and rise following an increase in gypsy moth population.

For sufferers, predators and parasites are a "wait-and-see-and-hope" proposition.

Scraping, trapping, and other approaches

Scraping off egg masses, says State Entomologist John Anderson, is not worth it if there are large numbers of them. Most egg masses will be 20 or more feet above ground and inaccessible. It might, however, be worth scraping and burning or disposing of the egg masses in kerosene if there are just a few in evidence. Under epidemic conditions, says Anderson, scraping off egg masses won't do much beyond "making the individual feel better."

Commercial gypsy moth traps, although varying in details of construction, contain a pheromone, or sex attractant, and a sticky substance or insecticide. Male moths, lured by the pheromone, become trapped in the stickum or are killed by the insecticide. In Connecticut, however, there are so many gypsy moths that even under low infestation levels, the traps are ineffectual in controlling populations.

Sticky bands (using a material such as Tanglefoot -- not grease which may kill trees) may be put around tree trunks to trap caterpillars as they travel up and down. Like the other home remedies, this has little practical effect when there are tens of thousands of caterpillars per acre.

Petroleum products, household detergents, Maalox, and a variety of other materials have been sprayed, painted, dabbed, or used to dunk gypsy moth caterpillars. Many substances will kill the insects but they also have serious side effects on tree foliage. The best rule to follow is: if the material is not registered as an insecticide, there is probably a good reason why it isn't.

Summary

After 110 years, the gypsy moth must be considered as an established pest. There is no known practical means of eliminating the insect, and, in fact, we are presently unable to control population build-ups. However, scientific research, coupled with vegetation management, will eventually provide the tools for reducing both the severity and frequency of gypsy moth outbreaks. In the meantime, the average Connecticut resident should learn to live with the critter as best he or she can. While living with gypsy moth caterpillars, do:

1. Avoid skin contact with caterpillars -- many people are allergic to the hairs. Gypsy moth caterpillars do not bite people.

2. Wash vehicles regularly -- caterpillar droppings can damage paint finishes.

3. Spray to protect valuable shade and ornamental plants or to reduce the number of caterpillars around your house. A bill for $100 for spraying is better than $1500 for repainting the house.

4. Recognize that so far chemical insecticides are more effective than biological agents.

5. Remember what the problem is like after the population collapses. The best time to control gypsy moths is when there are only a few. Don't stop supporting control efforts during the periods when your property is not crawling with caterpillars! ■

Events

Sunday, May 2, 1 p.m.
The DEP and the Connecticut Chapter of the National Wild Turkey Federation will hold a Wild Turkey Calling Seminar at the Bristol Fish and Game Association club house (follow signs from Route 69 south of Bristol). The public is invited. A donation will be requested at the door.

Saturday, May 8, 10 a.m.-4 p.m.
The American Indian Archaeological Institute (Route 199, Washington) will hold a workshop on "Archaeological Preservation and the Local Land Trust." Contact Research Department for details: (203) 868-0518.

Friday-Sunday, May 14-16, 10 a.m.-5 p.m.
The Connecticut Audubon Society will stage an exhibition of bird carving and wildlife art at the historic Burr Homestead, Old Post Road, Fairfield. Over 40 artists will be involved. Carvers from the United States and Canada will exhibit and sell their work. Selected wildlife artists will display their paintings. There will be demonstrations and a silent auction. Luncheon will be available. Advance tickets are $3 for adults; $2 for children, students, and senior citizens. Make check payable to "C.A.S. Bird Carvers Show" and mail order to: Mrs. Edward Duda, Connecticut Audubon Society, 2325 Burr Street, Fairfield, CT 06430. For additional information, call 259-6305.

Saturday, May 15, 9:30 a.m.-1 p.m.
The Thames Science Center offers "Hydropower Today and Tomorrow." Participants will visit two of the nine hydroelectric plants currently in operation in the Thames River watershed. Cost for members is $1, for non-members $3. Register by calling 442-0391. ■

Take a closer look
at common mosses!

By G. Winston Carter
Illustrations by Pamela Carter

Mosses can be found in many parts of the world and thus will crop up on many occasions when you travel. They are also one of the commonest of plants and can be found with ease in a short walk around your neighborhood or growing with lichens and liverworts on a roadside bank.

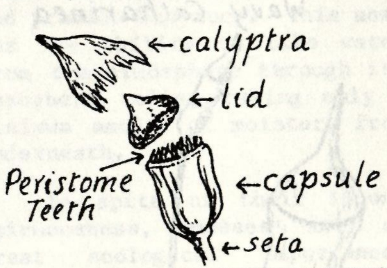
Mosses, when found in abundance, create an impression which requires no careful attention to detail, only a need to take in the whole. There seems to be a hushed silence that pervades some wooded areas that is intensified by the presence of mosses, lichens, and liverworts when these are present in profusion. An almost cathedral-like atmosphere prevails in this type of forest.

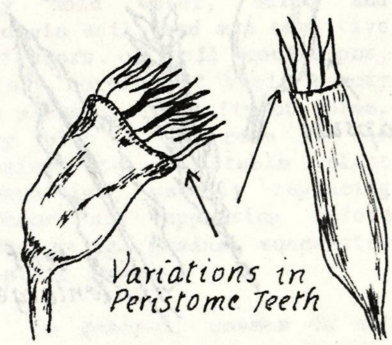
The world revealed by the hand lens and microscope also offers vivid impressions. Here, it is the close attention to detail, rather than the whole, that makes the mosses intriguing.

Many plants are called mosses which are really not mosses at all. We speak of reindeer moss, which is really a lichen; Irish moss, which is a type of red algae, and Spanish moss, which is actually a flowering plant belonging to the pineapple family. In order to correctly identify a moss as such we must consider its structural characteristics.

Liverworts and mosses are probably the two groups of plants that are most commonly confused, particularly a special group of leafy liverworts which are sometimes called "scale mosses."

Typical Moss Capsule



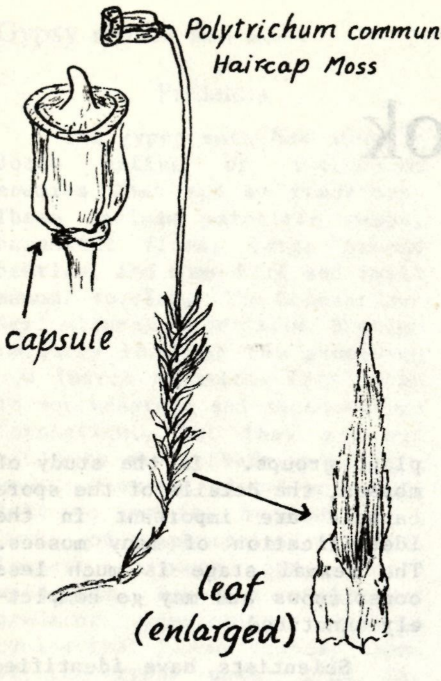


Variations in Peristome Teeth

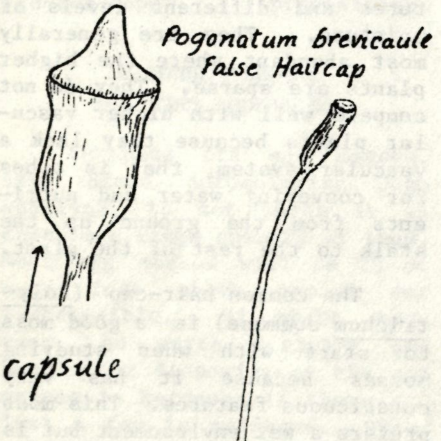
Let's look at the structure of these two groups of plants. The leafy liverworts are rather flat, having a definite top (dorsal) and bottom (ventral) side. They have leaves which grow more or less opposite to one another, and these have no midrib and are often lobed. The moss which may be growing alongside the liverwort has leaves that spiral around the stem, have a midrib, and are not lobed. Both groups do not have true leaves, stems, or roots, but they both have rhizoids for attachment to the substrate. They both reproduce by alternation of generations, which means that they have a sexual phase (gametophyte) followed by an asexual stage (spore-producing). The spore-producing stage is the conspicuous part of the life cycle of both these plant groups. In the study of mosses, the details of the spore capsule are important in the identification of many mosses. The sexual stage is much less conspicuous and may go completely unnoticed.

Scientists have identified about 23,000 species of moss. Only a few common types will be discussed. Mosses are found in a great many different places, and many mosses are not restricted to a single type of habitat because they are able to withstand a wide range of temperatures and different levels of moisture. They are generally most abundant where the higher plants are sparse. They do not compete well with higher vascular plants because they lack a vascular system, that is tubes for conveying water and nutrients from the ground up the stalk to the rest of the plant.

The common hair-cap (Polytrichum commune) is a good moss to start with when studying mosses because it has very conspicuous features. This moss prefers a wet environment but is found in a great many less favorable sites. It has a long thread-like seta, or bristle-like organ, which rises above a number of spirally arranged leaves. The seta supports a four to six-angled spore capsule at the top. This capsule is covered by a hair-like sheath, hence the name "hair-cap." A lid at the top of the capsule, called the operculum, encloses the spores. When the lid is removed, the peristome teeth are visible with a hand lens. In mosses, their number varies from four to 64, with the common hair-cap having 64. The number

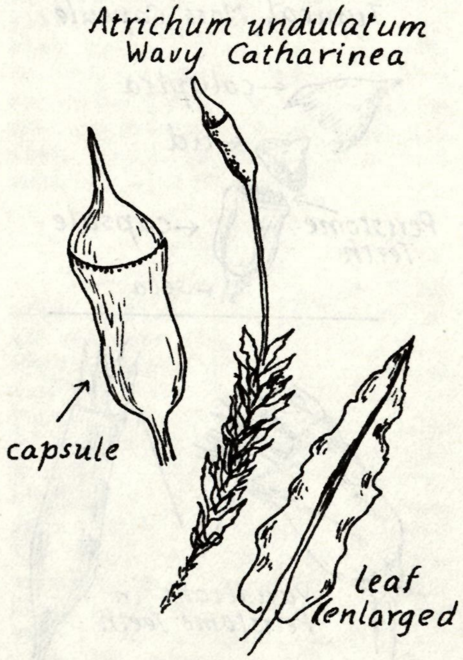


and appearance of the peristome teeth is often important in moss identification. The hair-cap moss commonly grows from three to six inches high, but may reach as much as a foot.

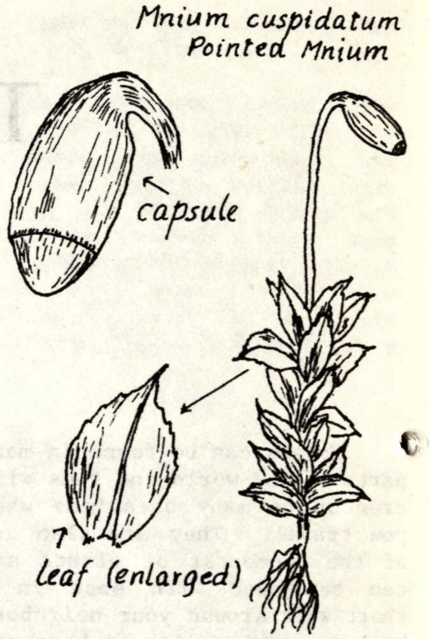


A type of moss that might easily be mistaken for hair-cap moss is the false hair-cap, member of the genus Pogonatum, the common member of this genus being the Short Pogonatum (Pogonatum brevicaule). It does resemble the hair cap because it has a hairy sheath or calyptra. It lacks the conspicuous ridges on the spore case which all true hair-caps have. This is a moss of acid habitats. It is a pioneer that may be found on steep banks of newly exposed soil such as ditches, streams, and, in particular, roadsides. It seems to prefer soil that is moist clay or silt.

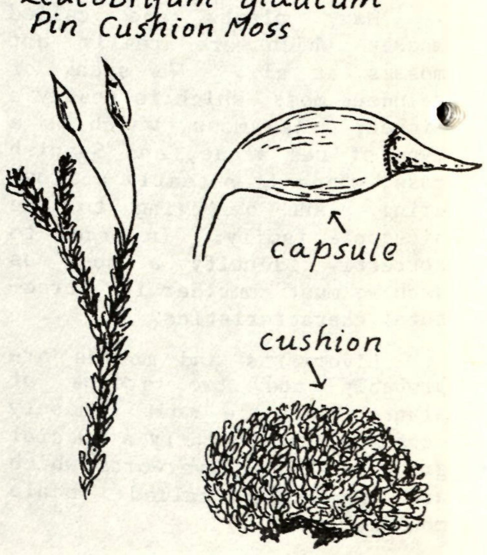
A trip of your garden may be all that is necessary to find the beautiful wavy Catharinea (Atrichum undulatum) with its slender, slightly curved spore cases. It can be distinguished from other members of its genus by its spiny, wavy leaves. You can find it in shady areas in woods or along a garden path. It is closely related to the hair cap but the sheath, or calyptra, is generally hairless, hence the generic name Atrichum, which means "without hair" as opposed to Polytrichum, or "many hairs."

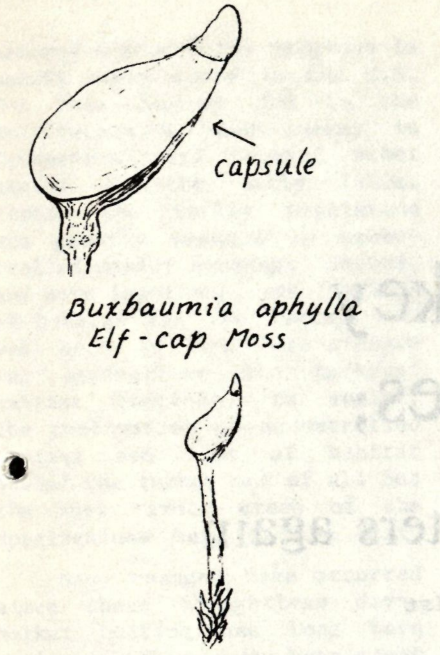


The pointed Mnium (Mnium cuspidatum) is a very beautiful, delicate species of moss found on some lawns and in moist, shaded places such as rotten logs, stumps, or at the bases of some trees. The translucent leaf of this species is very distinctive and is enough to make identification possible without the presence of spore cases. The upper half of the leaf is single-toothed, and the midrib extends to form a sharp point; the species name "cuspidatum" means "point."



Pin cushion moss (Leucobryum glaucum) is one of the easiest woodland mosses to identify. It seldom produces spore cases but it has a conspicuous growth habit which makes it possible to recognize it. It has forked branches bearing leaves about one-quarter inch in length which form blue-green cushions, usually about six inches in diameter, that may be four inches high in the center. Reproduction seems to occur when fragments of the leaves break off at their tips and become re-established. This moss grows on humus soil in moist forests, preferring an acid soil but not restricted to this condition.



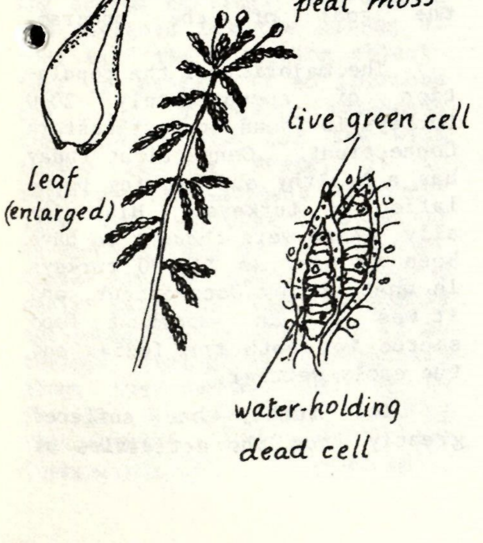


Buxbaumia aphylla
Elf-cap Moss

A tiny moss, the humpbacked elf moss (Buxbaumia aphylla), is so small it might go unnoticed. It often grows in moist decaying woods in shady places but may also grow in dry open woods. The leaves are few and are clustered at the base of the seta; they disappear as the spore case ripens. The Latin name, aphylla, means "without leaves," which describes this species. The spore case has an odd appearance which leads to its common name. It is tilted, flattened, and angular and is supported by the one-half inch seta.

There are many species of spagnum, or peat moss, and they are found widely distributed in North America. This large, light green moss is commonly found as a dominant plant in acid bogs or in some shallow lakes. It has the habit of growing at the top and dying off at the bottom. The underparts, over long periods of time, form peat. Peat is built at about one foot per hundred years.

Sphagnum palustre
peat moss



The leaves are the most important means of identifying members of this family because the spore producing specimens are difficult to find. The leaf structure is very different from that of many mosses, being made up of small green cells which are used for food manufacture and large transparent cells which can absorb and store water and provide buoyancy. This moss has the ability to take water from the atmosphere through its absorbent cells, taking only a minimum amount of moisture from underneath.

In spite of their inconspicuousness, mosses are of great ecological importance. They hold water, build and maintain soil, and are sensitive indicators of soil conditions, to say nothing of their beauty and pleasing diversity of forms. They play a key role in the development of stable plant communities, usually replacing lichens and appearing before herbs in the gradual succession of plant types.

In general, mosses do not have great importance commercially, but a few species are quite valuable to man. Species of spagnum furnish peat, a very important fuel in some parts of the world. Because of its absorbent quality this moss is used in industrial processes and in surgical dressings during times of emergency. Absorbent mosses are used for the propagation of seedlings and for packing fragile materials. In some parts of the world some of the large species of hair cap moss are used to make brushes, little brooms, lamp wicks, and small woven baskets.

When studying mosses a hand lens of ten to fifteen magnification and a compound microscope are a great advantage. Specimens being collected should be wrapped individually to separate species, and an effort should be made to find some specimens with spore cases. Indicate where the specimen was found, the kind of habitat, and the date collected.

To make a permanent collection, the specimens should be dried thoroughly. They can be put into paper packets of absorbent paper and pressed lightly. They can also be air dried. To protect the capsules, mosses should not be subjected to heavy pressure.

You can store mosses indefinitely in compartmentalized boxes or pressed and mounted on stiff paper and can bring them back to life years later by adding a little water. ■

(c) 1982 Gale H. Carter

Whale sails

Again this spring and summer Greenpeace New England will sponsor Whale Watches out of Provincetown and Plymouth harbor. The Dolphin III and the Dolphin IV, out of Provincetown, and the Cape Cod Princess, out of Plymouth, will travel to Stellwagen Bank, a major feeding ground for the humpback, right, finback, and minke whales on their migratory journeys up and down the Atlantic coast.

Tickets are $20 for adults; $17 for senior citizens and students; $14 apiece for members of groups of 10 or more if arrangements are made in advance. Part of the ticket price goes to support Greenpeace efforts on a variety of environmental issues.

Sailings on the Cape Cod Princess from Plymouth are scheduled for May 1, 7, 21, 23; June 4, 6, and 13.

Trips from Provincetown are scheduled for April 17, 18, 19, 23, 24, 25; May 2, 9, 14, 20, 23, 29, 30, 31; June 5, 6, 12, 13, 19, 20, 25, 27. The Dolphin IV from Provincetown will go out on a Greenpeace Whale Watch every Friday during July and August at 8:30 a.m.

For complete information and departure times, call 617-542-7052 or write Greenpeace Whale Watch, 286 Congress St., Boston, MA 02210. ■

In April tom turkey struts and gobbles;

in May he challenges State hunters again

By Steven N. Jackson, DEP Wildlife Biologist

One of the parents of State's turkey flock--five toms and 17 hens live-trapped in New York--awaited release. Note beard on breast.

From May 9th through May 23rd of 1981, Connecticut residents were able to hunt wild turkeys for the first time in 170 years. This first hunting season was a milestone in the seven year project to restore the wild turkey to the State. At the time of the wild turkey's introduction in 1975, hunting was not a goal of the program. It was thought that in such a densely populated and industrialized state as Connecticut the birds would probably never establish themselves well enough to produce a population that would withstand hunting. The turkey at one time lived throughout the State. Restoring it to all remaining habitat was the goal of the program.

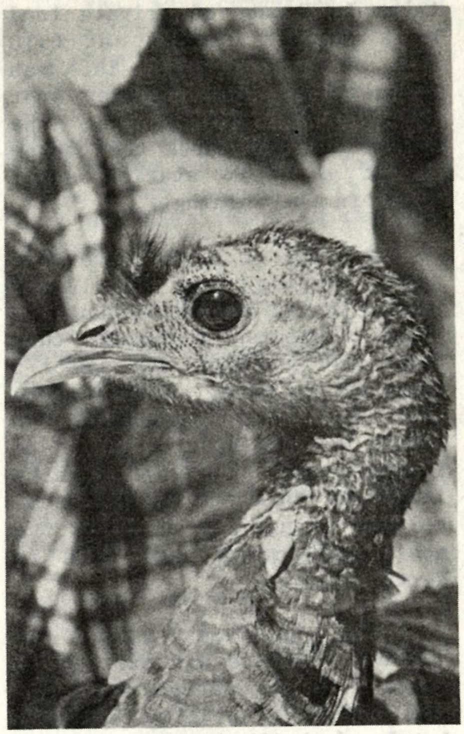
The majority of the population of approximately 2000 turkeys is found in northwestern Connecticut. Connecticut today has a healthy and growing population of turkeys. Historically, there were thought to have been as many as 12,000 turkeys in what is now Connecticut, and it was an important food source for both the Indian and the early settler.

The turkey has suffered greatly from the activities of man and his push for progress in nearly every state in the U.S. Two main factors led to the extirpation of the turkey in Connecticut and several other states by the early 1800s. First, the turkey population was greatly reduced by uncontrolled market hunting. Second, and more important, was the loss of habitat for the turkey. As vast acres of land were cleared for agriculture the turkeys' habitat continued to shrink. The combination of uncontrolled hunting and loss of habitat pushed the turkey out of all but the most remote areas of the Appalachians here in the East.

Many changes have occurred since those thoughtless days. Market hunting has long been outlawed. There have been great changes in land use in the Northeast. Most of the once open farmland is now again forested. The turkey has become more wary and better adapted to the presence of man.

The introduction of trapped wild turkeys into Connecticut came in 1975. Many previous attempts at stocking domestic, wild and domestic crosses, and wild turkeys raised in captivity had limited success. The reason for this failure is that the wild behavior of field born and raised turkeys is clearly superior to that of those raised in captivity. In live-trapped wild turkeys the learned information passed from hen to poult is not interrupted by captivity.

Because of the strength of the newly established turkey population there was no doubt that it was capable of supporting spring hunting. The season was designed for the spring of 1981 with the following objectives in mind: 1) to increase the level of public awareness and appreciation for the wild turkey in our State; 2) to reinforce the waryness so necessary for the turkey's survival in Connecticut; 3) to encourage these nomadic birds to extend their range to land currently not populated by turkeys; 4) to collect biological information about the turkey; and 5) to provide a new high quality recreational opportunity for Connecticut's sportsmen.



Descendants of this and 21 other wild trapped turkeys introduced into Connecticut in 1975 now number about 2,000.

The season bag limit was one bearded turkey. No fee was charged for any of the permits in 1981. Please consult the Deer and Turkey Field Guide for complete regulations information for the 1982 season.

Permits

There were three types of permits available for turkey hunting in Connecticut; State land, private land, and free landowner.

Turkey permits for State and private land were allotted through randomized computer selection. A person selected for a private land permit was required, upon notification, to return the notice card along with a "Consent to Hunt Turkey" form, signed by the owner of 25 acres or more of land located in the selected zone. Without a consent form the permit could not be issued. A hunter could obtain as many consent forms from different landowners within his hunting zone as desired but could only hunt on those portions of the property that were within that zone. One consent form could be signed for the first full 25 acres and one for each additional full 50 acres.

A person could be selected for one area (State) or one zone (private), provided only one application was filed and it was correctly completed.

A total of 4,212 applications were filed for turkey permits. A person applying for a State land permit had a one in 13 chance of being picked for the area of his choice. A total of 428 of these permits were issued. Only four permits were issued to nonresidents.

Deed listed landowners with 25 acres or more located within a Turkey Hunting Zone were able to obtain a Free Landowner Permit without lottery selection provided they were willing to sign forms for lottery-selected private land hunters of their choice. One permit was issued for the first full 25 acres and one more for each additional full 25 acres thereafter. Landowners were restricted to hunting on property that they actually owned with this permit. If they wished to hunt on State land or the private property of another, a regular State and private land application had to be filed. Only 15 such landowner permits were requested and issued.

A telephone survey was conducted to determine why the quota of 716 private land permits was not issued. A major reason was that only 561 people were selected for private land permits. The remainder of the quota was not filled because of a lack of private land applications. Eighty-eight (88) hunters who were selected to hunt but did not complete the process to obtain a permit were questioned by telephone to determine why their efforts were terminated. Of those surveyed, 69 percent were chosen by the lottery for their first choice of areas/zones. The survey showed that 44 percent of the hunters could not secure permission from the landowner; 52 percent did not contact a landowner or try to get permission to hunt. A variety of other reasons were listed for not completing the process, including: intention to apply for state land, not selected for first choice of zones, physically unable to hunt, did not know a consent form was necessary, license suspended, landowner issued too many consent forms, lost notification card, other plans, and missed the deadline for returning the notification card.

It is apparent that private land hunting presented some problems to hunters. This problem is influenced by the fact that turkey hunting was permitted on only about 700 square miles of our State during 1981. A majority of the hunters resided outside the turkey hunting zone, magnifying the problem of securing permission to hunt on private land.

Check stations

Twenty-one (21) turkeys were checked in at three check stations during the 13 day hunting season. All turkeys registered at an official check station were subject to the collection of biological information such as age, weight, beard length, spur length, diseases, leg bone length and diameter, location of kill and habitat of kill. The information collected at the check stations on each turkey is extremely valuable in determining the health, age distribution, geographic densities, effects of hunter density on the harvest, and reproduction in the turkey population. Only basic field dressing, defined as removal of internal organs, was allowed before bringing a turkey to an official check station.

The first turkey was brought into the Housatonic Meadows Check Station at 7:42 a.m. on the first Saturday of hunting, May 9. It was taken in Cornwall by a resident of Meriden. Field dressed, the adult turkey weighed 16.8 lbs. Six more turkeys were taken that morning. Five of the seven turkeys taken on opening day were harvested on private land.

The largest turkey taken during the season weighed 23 pounds, live weight, and was taken in Canaan on private land by a Norfolk resident at 6:10 a.m. on opening day. This was actually the first turkey shot during the season, but the hunter did not check the turkey in at a check station until later in the morning.

A total of 3,206 hours were spent hunting over the 13-day period by 282 reporting hunters. These hunters reported they heard 554 gobblers and saw 175 toms and 96 hens. Most hunters who were not successful in taking a bird attributed it to inexperience. Many remarks indicated that the turkey seems to have earned its place as the most challenging game bird in North America.

The greatest amount of hunting pressure was exerted on State land on Saturdays. The 141 hunters responding put in a total of 1,691 hours on State land to take seven turkeys. There were fewer hunters on private land, yet 14 turkeys were killed. This can be attributed to several factors: the best available habitat for turkeys is found on private land, and the more hunting pressure an area receives, the more likely a turkey is to become silent or move to another area. An increase in hunting pressure also brings with it an increase in interference between hunters.

Many hunters indicated in the comment section of the hunter report card that they would like to see the dates of the season changed. The turkey season was scheduled for the second through the fourth Saturday in May because it is the best time biologically to allow a two-week spring hunting season. During this period, hens are incubating eggs and are least likely to be killed or disturbed from the nest. Toms have bred nearly all of the receptive hens and can then be safely harvested with no impact on the future of the turkey population.

In April, the male struts and gobbles before a group of hens, performing his courtship display. He gobbles frequently in the early morning and again at dusk. When a gobbler has gathered a group of five or six hens, he becomes less vocal and concentrates on these females. Although a male and female may mate more than once, usually once is enough to fertilize the eggs.

As nesting time approaches the hen becomes less interested in the tom and seeks out a place for her nest. By the end of the first week in May, most of the hens are on nests of eight to twelve eggs. The tom then increases his gobbling activities in frustration over the hens' lack of interest. This activity lasts well into June. During a season scheduled during this period, only toms and perhaps an occasional hen who is not nesting will respond to the hunter's calls.

Hunting was permitted from one-half hour before sunrise until twelve o'clock noon to limit the possibility of a hunter's coming in contact with a hen and mistakenly identifying her as a tom. Hens usually leave the nest in the afternoon to feed, so there is a greater possibility that a hunter would see a nesting hen then. The air temperature normally is higher in the afternoon so the eggs in the nest stay warm, even while the hen is out feeding.

The regulations for the 1982 Spring Turkey Season will be very similar to the 1981 regulations, with only a few minor changes.

Please continue to report any sightings or signs of turkeys. These reports serve as valuable tools to the wildlife biologist.

The Connecticut Chapter of the National Wild Turkey Federation has posted a $200 reward for information leading to the arrest and conviction of anyone illegally killing a wild turkey in Connecticut. To report poaching, call 566-3333 or your local Conservation Officer. For further information on the reward, call the Turkey Federation office at 324-6483. ■

Heritage report
From page 2

of the historical, cultural, or natural resources of the State, was charged with submitting a report to the Governor and the General Assembly on or before January 1, 1982.

To develop its recommendations, during the spring of 1981 the Task Force met with various interested citizens and representatives of State agencies and held a series of public meetings in seven locations around the State to involve representatives of various groups involved with the arts, the natural environment, and the historic environment.

Among Task Force recommendations were: making mandatory elementary and secondary level educational programs dealing with Connecticut's heritage; development of a program to prepare oral histories; development of a series of Heritage Areas in which natural, historical, and cultural heritage resources interact in a valuable manner; broadening the scope of Historic Districts to include adjacent undeveloped lands and individual landmarks; adoption of a State Endangered Species Act; and encouragement of the development by municipalities of property tax and assessment policies consistent with heritage preservation. ■

Emissions bill
From page 20

Roger Smith, chairman of G.M., has written in The New York Times that the Traxler-Hillis bill "should be acted upon by the congress as soon as possible," and I agree --but not in the manner he suggests. It should be soundly defeated.

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The preceding article appeared in The New York Times on December 13, 1981. Since that time an additional bill (H.R. 5252) has been introduced by Congressman Thomas Luken (D, Ohio); this bill supersedes and incorporates sections of H.R. 4400.

You, as a concerned citizen can write your congressmen to let them know how you feel about this proposed bill and the Clean Air Act's reauthorization. Since the Clean Air Act may very well become an election issue in 1982, your opinion will carry more and more clout as the year progresses.

Write:

Senator Christopher Dodd
U.S. Senate
Washington, D.C. 20510

Senator Lowell Weicker
313 Russell Senate Office Building
Washington, D.C. 20510

Rep. Sam Gejdenson
(2nd District)
1503 Longworth House Office Building
Washington, D.C. 20515

Rep. Lawrence DeNardis
(3rd District)
1429 Longworth House Office Building
Washington, D.C. 20515

Rep. Stewart McKinney
(4th District)
106 Cannon House Office Building
Washington, D.C. 20515

Rep. William Ratchford
(5th District)
432 Cannon House Office Building
Washington, D.C. 20515

Rep. Toby Moffett
(6th District)
127 Cannon House Office Building
Washington, D.C. 20515

For more information, call the National Clean Air Coalition Clean Air Hotline at (202) 541-5551. An updated tape will inform you about clean air legislation and what you can do about it. ■

Award established
From page 21

to recognize significant contributions by individuals or organizations to the cause of conservation of Connecticut's natural resources, a cause to which Milan Bull was dedicated throughout his lifetime. The Award will be presented from time to time as the Citizen's Advisory Council deems advisable.

Nominations for the first Award are now being solicited. Nominations, in brief narrative form, should be submitted to the "Milan J. Bull Award Committee," c/o Patrick L. Carroll III, Esq., 1891 Post Road, Fairfield, Connecticut 06430. All nominations should be received by the committee by May 1, 1982. The Committee also invites interested groups or individuals to make contributions to the Award Fund in any amount. Any such contributions may be sent to the same address. ■

Dig some history!

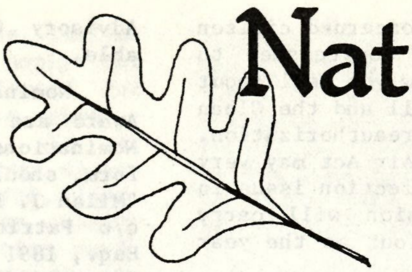
Old Sturbridge Village and the Connecticut Historical Commission, in conjunction with the University of Connecticut Summer Sessions, will offer an eight-week field school in historical archaeology during June and July.

The cooperative program in Connecticut's historical archaeological heritage will focus on the early industrial village of Phoenixville (Eastford) and the 18th century Newgate Prison Complex (East Granby). It runs from June 7 to July 30.

The Fifth Old Sturbridge Village Field School in Historical Archaeology makes up the first five weeks of the program. Students will receive orientation in early 19th century history and material culture at the museum and at Phoenixville and will be involved in a range of field work.

For the final three weeks, the program will focus upon the identification and evaluation of surviving archaeological, architectural, and ecofactual data associated with the National Landmark ruins of 18th century Newgate Prison.

For further information, contact: Dr. John Worrell and David Simmons, Old Sturbridge, MA 01566 (617-347-3362) or David A. Poirier, Connecticut Historical Commission, 59 S. Prospect St., Hartford, CT 06106 (203-566-3005). ■



Nature Notes

by Penni Sharp

Local flora offer some 'bad eating'

Early settlers arriving in this country confronted a number of trying situations. Free of one form of oppression, they were nonetheless forced to struggle for survival in an alien land. To survive, one needed to eat, and in those early days many relied on wild plants as a source of food. Faced with unfamiliar flora, many of the early settlers experienced problems with poisonous plants.

The fact that many plants have powerful properties has long been known to man. Hunter-gatherer civilizations have used plant preparations for such things as the making of poisonous arrows or the spreading of plant toxins on water in order to stun fish. More advanced civilizations have utilized plant toxins in sophisticated ways. Familiarity with poisonous plants can be traced to the early Greeks. Poison hemlock (Conium sp.) is the plant believed to have been used in the death of Socrates. The use of poisonous plants reached its peak during the Renaissance, culminating in the notorious activities of the Borgia and Medici families.

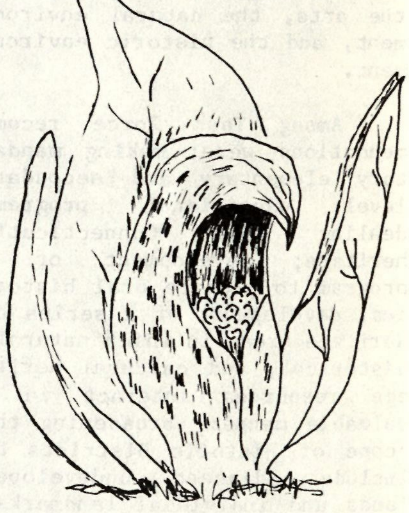
Plant poisonings are not merely historical phenomena. Annually, an estimated five percent of human poisonings are attributed to the consumption of toxic vascular plants. In recent years, the renewed interest in natural or wild foods may have lead some inexperienced people to harvest and consume plants that are potentially harmful.

The adverse effects induced by plants result either from ingestion of or external contact with a plant. Plants, when eaten, can be toxic due either to the direct effect of plant compounds or to the breakdown of certain compounds into harmful substances. External contact with the broken parts of plants such as poison ivy can result in a painful skin rash, and the stinging hairs of nettles can inflict pain on those who touch them.

Most of the toxic substances that are found in plants are secondary compounds. Secondary compounds are miscellaneous substances that occur in plants yet are not involved in primary functions such as respiration and photosynthesis. These compounds are most prevalent in the angiosperms, or flowering plants, and include alkaloids, glycosides, saponins, tannins, and resins.

Approximately 150 of the uncultivated vascular plants in Connecticut have poisonous properties of one sort or another; that is, these species have been recorded as inducing harmful effects, sometimes death, in human beings or domestic animals, principally livestock. A significant number of these species flower in Connecticut between February and May and are well-known species of our woodlands. Many were used historically in the practice of medicine, probably with frequent fatal results. Often, it is merely the degree of dosage that separates medicinal from poisonous attributes in a given plant.

Skunk cabbage
(Symplocarpus foetidus)



Anyone wishing to sample some of the plants in Connecticut should become knowledgeable about the local flora and potential power of many of the native plant species. (Many wildflowers also should not be picked due to their fragility and lack of widespread occurrence.) Some plants to approach with caution include the following:

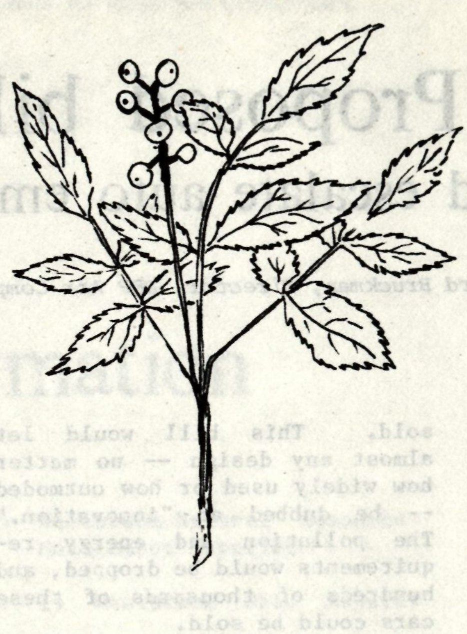
Skunk cabbage (Symplocarpus foetidus) leads the group of spring-flowering plants. The flowers are formed underground in the fall, and, during February, the entire inflorescence, shielded by a handsome hooded spathe, pushes up through the ground. When crushed, this plant gives off a powerful musky scent which is described by its common name. Perhaps the most unique feature of skunk cabbage is its ability to generate heat and to maintain an almost constant 72° F. temperature provided that air temperatures are above freezing. It can actually melt surrounding snow. When temperatures drop below freezing, skunk cabbage can pull deeper into the soil by contracting its roots.

Skunk cabbage's numerous tiny flowers are clustered on the rounded spadix which is protected by the purplish hood. Pollinators are attracted to the flowers by their distinctive odor. After the flowers fade, the coiled leaves appear. They are bright green, grow to a very large size, and carpet many of Connecticut's swamplands.

Skunk cabbage can be toxic because of the needle-like crystals of calcium oxalate which are formed by the plant. Ingestion will cause severe burning in the mouth and throat. Treatment includes the application of cold packs to lips and mouth and the use of antihistamines. Repeated boilings of skunk cabbage with addition of baking soda will neutralize the calcium oxalate. Despite its potentially unpleasant effects, this plant was used by the Indians who prepared a flour from the rhizomes (roots).

False hellebore (Veratrum viride) is a member of the lily family and shares a similar habitat with skunk cabbage. It has a superficial resemblance to skunk cabbage in that it has large, bright green leaves. False hellebore can grow to a height of six feet. It has unbranched stems which bear the numerous, thick-ribbed leaves. Star-shaped, greenish flowers appear during May.

False hellebore contains a number of complex alkaloids that are toxic to humans and other animals. Some of the alkaloids that have been isolated have a pronounced effect on the human circulatory system, lowering blood pressure and slowing the heart rate. Excessive doses can have a reverse effect, raising blood pressure and causing a rapid pulse. A number of recorded human poisonings have been attributed to this plant. It has a medicinal history as well. Concoctions of the plant have been applied externally for treatment of scurvy and lice. It was also used to depress the heart's action and as a remedy for arthritis. Medicinal use of this plant was abandoned for a time due to its lethal potential. However, a stable preparation is used in modern day medicine to reduce high blood pressure.


White baneberry
(Actaea pachypoda)

White baneberry or doll's eyes (Actea pachypoda) is a perennial plant which has a number of compound leaves and small white flowers. This plant is conspicuous after the berries have ripened. These unusual, china-like fruits are borne on thick red stalks and are white with a purple spot in the center. These distinctive berries give the plant the common descriptor, "doll's eyes."

All parts, but especially the rocks and berries, of baneberry are poisonous. The toxicity is due to an essential oil which produces acute cramps and nausea and to a glycoside that produces similar symptoms. It also has caused dizziness and circulatory failure. In 1903, Alice Bacon experimented with the berries and recorded the following experiences:

> At first there was the most extraordinary pyrotechnic display of blue objects of all sizes and tints, circular with irregular edges. As one became interested in the spots, a heavy weight was lowered on top of the head and remained there, while sharp pains shot through the temples.

She also reported burning in the stomach, pain in the kidneys, and a rapid pulse. Judging from her experience, one should definitely avoid eating these berries!

May-apple (Podophyllum peltatum) is distinguished by its large, deeply lobed, umbrella-like leaf. Either one leaf (non-flowering plant) or two leaves (flowering plant) grow up from a fleshy rootstock. Where the two leaves join, a single nodding white flower blooms, possibly escaping notice since it is overshadowed by the leaves. The "apple" is a large, yellow, multi-seeded berry and is the only edible part of the plant.

Many physiologically active compounds are present in may-apple. Ingestion of plant parts can cause severe gastrointestinal upset. May-apple appeared early in the American Pharmacopeia and had recognized medicinal properties as a strong purgative. A crude resinous extract of may-apple, "Podophyllin," was responsible for human poisonings, and its misuse resulted in several deaths. Because "Podophyllin" contains compounds that have cytotoxic effects, today there is renewed interest in may-apple for use in chemotherapy treatments for carcinoma.

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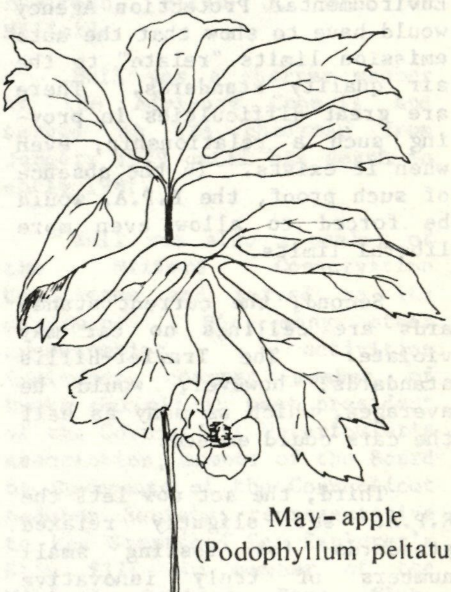
May-apple
(Podophyllum peltatum)

Proposed bill
would escalate auto emissions

By Leonard Bruckman, Director, DEP Air Compliance Unit

Representatives Bob Traxler, Democrat of Michigan, and Elwood Hillis, Republican of Indiana, have introduced a bill in Congress (H.R. 4400) to relax motor vehicle pollution requirements. Its supporters include the General Motors Corporation.

This bill is not a moderate proposal. It would more than double the allowable emissions of carbon monoxide and oxides of nitrogen from new cars and increase hydrocarbon emissions by 40 percent. Bad as that sounds, it is only the beginning of the bad news. The Traxler-Hillis bill contains provisions that weaken the standards far beyond what is apparent just looking at the numbers.

First, under this bill, the Environmental Protection Agency would have to show that the auto emission limits "relate" to the air quality standards. There are great difficulties in proving such a relationship, even when it exists. In the absence of such proof, the E.P.A. would be forced to allow even more liberal limits.

Second, the current standards are ceilings no car may violate. The Traxler-Hillis standards, however, would be averages, which as many as half the cars could exceed.

Third, the act now lets the E.P.A. set slightly relaxed standards for testing small numbers of truly innovative engine designs promising energy benefits. There are limits on how far standards may be relaxed and how many such cars may be sold. This bill would let almost any design -- no matter how widely used or how outmoded -- be dubbed an "innovation." The pollution and energy requirements would be dropped, and hundreds of thousands of these cars could be sold.

Fourth, Traxler-Hillis would open large loopholes in testing procedures. And even if violations are found, manufacturers would not have to recall and fix the offending cars. They could simply promise to "make up the difference" in a later year.

Finally, Traxler-Hillis would effectively eliminate pollution control warranties. This means fewer people will be willing or able to have malfunctioning pollution controls repaired.

What all this boils down to are substantial increases in pollution -- increases that go far beyond those that a casual reading of the bill would suggest and that probably exceed the intent of the bill's authors. These increases will aggravate our already critical air quality problem, since vehicle pollution is the major participant in the formation of smog.

Auto makers argue that they simply cannot meet the current standards economically. That does not seem reasonable to me. As early as 1973, the Japanese, using stratified-charge engine technology, developed a car that met these standards and was capable of being mass-produced at reasonable cost. One must seriously question why American companies, nearly 10 years later, still have not been able to do the same.

The economic argument does not wash either. Yes, the auto industry is beset by problems, but they are not clean air problems. The auto makers have been hurt by high interest rates, low productivity, lax quality control and poor planning. Gutting the Clean Air Act will not noticeably help their plight.

Nor will it benefit the consumer. True, there might be a reduction in initial cost to the auto purchaser. However, the added pollution that will be a result from the passage of this bill will adversely affect public health and deteriorate metals, masonry, fabric, agricultural crops and a host of other materials.

These adverse economic consequences, although seemingly trivial when considered individually, add up to a considerable sum in the aggregate and would quickly negate any gains the consumer realizes from a reduced sticker price.

Such is the lesson we are learning from our past practices concerning the disposal of hazardous wastes. We could have developed safe, effective methods of disposal for a few hundreds of thousands of dollars a few decades ago. But we didn't, and now we're paying the price, which is expected to be hundreds of millions of dollars for cleanup of dump sites in the Northeastern states alone.

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For Your Information

By Leslie Bieber,
Citizens' Participation Coordinator

Commission gives resource center

The Westbrook Conservation Commission has donated a Natural Resources Information Center to the Westbrook Public Library. It is the hope of the Commission and the Library that students, teachers, town officials, and the general public will feel free to use this collection.

The collection is divided into five major categories: I) Westbrook Natural Resource Management Material; II) Connecticut Natural Resource Management Material; III) Land Use Planning Material; IV) Environmental Education Material; and V) Natural Resource Pamphlet Collection.

Types of materials available in the five sections are listed below. All material in the collection is listed in the card catalog by main entry (author, or if no author, by title), title, subject, and under Natural Resources Information Center.

Certain items in the collection are "Reference" (in-library) use only because of the difficulty in replacing them. Most material can be checked out for two weeks by presenting a library card; renewals are possible provided that no other reader is waiting for the item.

The following are the types of materials listed under each major category:

I) Westbrook Natural Resources Management Material

- 1) Westbrook Site Reports
- 2) Water Resources
- 3) Refuse and Refuse Disposal
- 4) Planning and Zoning Material
- 5) Inland Wetlands
- 6) Topographic Maps
- 7) Westbrook Area Studies

II) Connecticut Natural Resources Management Material

- 1) Connecticut Regulations
- 2) U.S. Army Corps of Engineers Material
- 3) Environmental Laws
- 4) Connecticut Boating Laws

III) Land Use Planning

- 1) Connecticut Conservation and Development Material
- 2) Connecticut Coastal Management Material
- 3) Land Use - State and Regional Material
- 4) Land Use - Connecticut Environmental Surveys

IV) Environmental Education Material

- 1) Connecticut Environmental Education Centers and Resources
- 2) Environmental Education Programs
- 3) Environmental Education Teaching Materials
- 4) Soil Conservation Material

V) Natural Resources Pamphlet Collection (filed by subject heading)

The Natural Resources Information Center is one example of the kind of project a local club or commission can undertake. With ease of access to this material, citizens can gain knowledge which may ultimately help in the municipal planning and development process. For further information on the Center or its materials, contact Tom ODell, Chairman, Westbrook Conservation Commission, Old Horse Hill Road, Westbrook, CT 06489. ■

Conservation award established

The Citizen's Advisory Council to the Conservation/Preservation Division of the Connecticut Department of Environmental Protection has announced that a Conservation Award has been established in the memory of the council's late chairman, Milan J. Bull of Milford.

Bull was a charter member of the Advisory Council and served as its chairman from January 1979 until his death in early 1981.

Bull was also a member of the Milford Conservation Commission and served as its chairman. His many other conservation activities included: charter member of Ducks Unlimited; past president of the Connecticut Waterfowler's Association; member of the Board of Governors of the Connecticut Audubon Society; representative to the Stratford Sea Explorer's Ship #37; and member of the Milford Striped Bass Club.

The Milan J. Bull Conservation Award has been established

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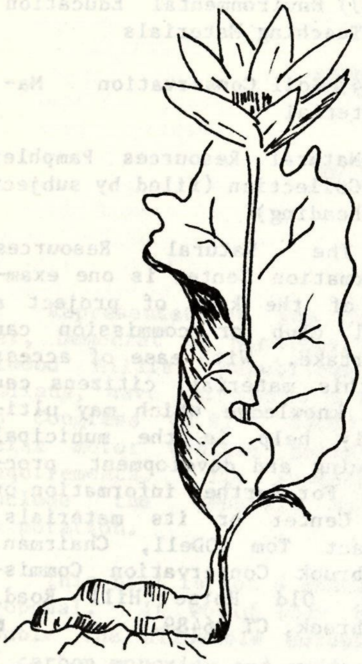
Bad eating

From page 19

Bloodroot
(sanguinarea canadensis)



Bloodroot (Sanguinarea canadensis) is one of the earliest of the woodland wildflowers to appear in the spring. As it grows, one delicate white flower protrudes above an enveloping pale green leaf. Leaf and flower are borne on separate stalks that grow from an underground rhizome. The generic name Sanguinaria is derived from the Latin "sanguis," meaning blood. This is an appropriate epithet as the juice of the stout rhizome and the stems is a blood red color.

Bloodroot contains several poppy alkaloids. If eaten, bloodroot can cause nausea, difficulty in breathing, coma, and, in severe overdoses, cardiac paralysis. Bloodroot, too, was once used medicinally. The root was gathered, ground, and prepared as a tincture. This substance was used as an emetic, as an expectorant for treatment of coughs, and as a pain reliever. Due to its potency, the use of bloodroot was discontinued.

These are but a few of the common spring flowering plants of our woodlands that contain compounds which give them strong, potentially lethal, properties. Harvesting and eating wild plants can be a fascinating hobby--but it is one that should be pursued with caution! ■

Public Hearings

April 29, 1982; 10:30 a.m.
Community Rm., Danbury Public Library, 170 Main St.
The Department of Public Utility Control is considering an application of the Racing Brook Water Company for a rate increase.

May 6, 1982; 7 p.m.
North Haven High School, West Campus, North Haven
To consider application of Mall Properties, Inc., New York, to discharge storm waters and sanitary sewage from a regional shopping mall to North Haven Sewerage facilities and the Quinnipiac River.

May 24, 1982; 7 p.m.
North Haven High School, West Campus, North Haven
To consider application of The Humphrey Chemical Company to discharge 4,380 gallons per day of wastewaters from manufacture of organic intermediate chemicals to surface and ground waters in the Quinnipiac River watershed.

Permits Issued

Encroachments

2/19/82: T. James Murray & Henry Rose, Glastonbury
To construct a 220-foot riprapped swale to Roaring Brook riverward of established stream channel encroachment lines for the Connecticut River in conjunction with the proposed South Hollow Development. Conditions.

Tidal Wetlands
Structures & Dredging

3/2/82: Harold Ballou, Branford
To construct a 7 x 115 ft. pile and timber pier with attached 4 x 15 ft. ramp and 6 x 144 ft. floating dock in the Branford River and adjoining tidal wetlands. Conditions.

3/4/82: Steven Aubrey, Old Saybrook
To construct and maintain a 20 x 10 ft. stone dock extending 5 ft. beyond mean high water and within tidal wetlands in Deep Creek, Lyme. Conditions.

Dams

1/28/82: Dept. of Utilities, Groton
To construct a dam on the Poquonock Reservoir in Groton. Conditions.

Tidal Wetlands

1/26/82: Arnold Peterson, Branford
To retain and maintain 4,300 sq. ft. of fill on State-regulated tidal wetlands at Short Beach in Branford. Conditions.

Inland Wetlands

1/20/82: Peter Montfort, Brookfield
To fill approximately 1.75 acres of inland wetland, excavate a 3.5 acre pond, and discharge storm water drainage into wetlands in association with development of a 7-lot industrial subdivision in New Milford. Conditions.

1/27/82: Town of Stratford
To dredge an existing 1/4 acre manmade pond to a depth of approximately 4 ft. Conditions.

Structures & Dredging

1/25/82: City of New Haven Bureau of Engineering
To excavate approximately 10,500 cubic yards of sediment and backfill with 9,500 cubic yards of crushed stone as part of installing sanitary sewer pipes across the Quinnipiac River between the I-95 crossing and the Tomlinson Bridge. Conditions.

2/24/82: Thomas J. Ross, Jr., Darien
To dredge approximately 2,000 cubic yards of sand and mud from Darien River and place riprap seaward of existing masonry wall for erosion protection. Conditions.

1/29/82: Dodson Boat Yard, Inc., Stonington
To dredge 300 cubic yards of material and construct a 6 x 242 ft. U-shaped floating dock in Stonington Harbor. Conditions.

1/29/82: City of Stamford, Parks & Natural Resources
To dredge an area and install floating docks in the East Branch of Stamford Harbor at Czescik Park. Conditions.

3/1/82: Arthur C. Heublein, Ocean Ridge, Florida
To construct and maintain an 80 ft. extension to an existing 65 ft. private pier off North St., at Wamphassuc Pt. in Stonington Harbor. Conditions.

3/1/82: N. J. Blazensky, Jr., Glastonbury
To construct a private 5 x 60 ft. pier with attached 6 x 20 ft. floating deck in Stonington Harbor at East Neck Rd., Wamphassuc Neck. Conditions.

3/8/82: New Haven Marina, Inc., New Haven
To retain and maintain the existing marina off Cove Street in Morris Cove. Conditions.

3/16/82: Pootatuck Yacht Club, Stratford
To construct and maintain an 86-foot T-head extension to a pile and timber pier extending 422 feet channelward of mean high water into the Housatonic River at Stratford. Conditions.

3/22/82: Paul J. Tomko, Sr., Norwalk
To construct and maintain a ramp and 120 linear feet of floating dock extending 52 ft. beyond mean high water into the Norwalk River at Commerce St., Norwalk. Conditions.

3/22/82: Rope Realty, Inc., Mystic
To dredge by clamshell bucket 3,900 cubic yards of material around Seaport Marine commercial docking facility in the Mystic River at Mystic. Conditions.

3/23/82: River Landing Marina, Old Saybrook
To remove existing docks and replace with pile and timber piers with attached finger piers and place three floating breakwaters surrounding piers in the Connecticut River at Ferry Rd. in Old Saybrook. Conditions.

Water Compliance

1/5/82: Wyckoff Steel, Division of Ampco - Pittsburgh Corporation, Putnam Works
To discharge treated steel pickling wastewaters to the groundwaters in the watershed of the Quinnebaug River in Putnam in an average daily flow of 25,000 gallons per day. Conditions.

1/5/82: Alinabal, Inc., Milford
To discharge 17,500 gallons per day of non-contact cooling water and treated metal finishing wastewater to a tributary of Indian River in Milford. Conditions.

1/5/82: United Illuminating Company, New Haven
To discharge to New Haven Harbor plant condenser and equipment cooling water in a average daily flow of 410,000,000 gallons per day at a maximum temperature of 95°F. Conditions. (Amended order.)

1/5/82: The Keeney Manufacturing Company, Newington,
To discharge to a tributary to Mill Brook in Newington an average daily flow of 60,000 gallons per day of wastewaters. Conditions.

1/19/82: Milford Rivet and Machine Company, Milford
To discharge 1,800 gallons per day of pretreated burnishing and tumbling wastewaters to the City of Milford sewerage system. Conditions.

1/19/82: Norden Systems, Subsidiary of United Technologies, Norwalk
To discharge 31,000 gallons per day of pretreated metal finishing wastewaters to the City of Norwalk sewerage system. Conditions.

1/26/82: The Rockbestos Company, East Granby
To discharge filter backwash, test tank drainage, cooling overflow and boiler blowdown to the Town of East Granby sewerage system in an average daily flow of 1,262 gallons per day. Conditions. ■

Cooperative Spring Field Trial Program

The Wildlife Unit has announced dates and locations for spring Cooperative Field Trials. These dog trials are held on state field trial areas. Birds used are cooperatively supplied by the Department of Environmental Protection and individual field trial clubs.

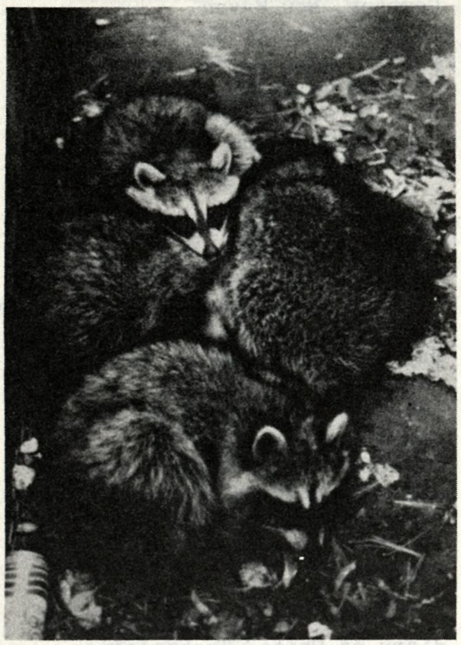
Any field trial clubs wishing to participate in the fall Cooperative Field Trial Program should file applications prior to June 1. If additional information is needed, please contact the Wildlife Unit at 566-4683.

May 1 & 2	New Britain Field Trial Club	Flaherty Field Trial Area, East Windsor
May 2	Fin, Fur, Feather Club	Mansfield Hollow, Mansfield
May 8 & 9	Associated Field Trial Clubs of Connecticut	Flaherty Field Trial Area, East Windsor
May 21, 22, 23	Barbar Hill Field Trial Club	Flaherty Field Trial Area, East Windsor
May 30	Connecticut Valley Bird Dog Club	Mansfield Hollow, Mansfield
June 5 & 6	Nutmeg German Shorthaired Pointer Club	Flaherty Field Trial Area, East Windsor

Note: All of the above trials are non-shooting, utilizing bobwhite quail

Dinner at eight

By George O'Brien,
Osbornedale State Park



Awake again, I stretched and groaned. AAAAhhh!!! OOhh! My empty belly rumbled in reply--a rascally raccoon like me is always hungry.

Sniffing the crisp cold air of the evening, I caught an arousing aroma: FOOD!!! Being a raccoon during camping season can't be beat!

I scrambled head first down the hollow oak and paused to listen. Only whispers of wind.

Nimbly moving down familiar paths, I eased up to a darkened campsite. My glance fixed on an ice chest near a snoring tent.

Moments later I had opened Coleman's newest locking device and searched through the spoils. Eggs, hotdogs, hamburg patties, potato salad. . .

"Alice! Look! A raccoon in the ice chest!"

"Our Food! Do something, Fred!"

"Calm down, Alice. Where's, the broom for the tent?"

"In the corner. Don't hurt him."

"If he touches my beer I'll kill him."

Enjoying the attention, I hammed it up and shoved a whole hamburg patty in my mouth. Fred came out with the broom but was at least fifteen feet away. No cause for alarm yet. Keep eating. Twelve feet. Ten feet. Two hotdogs. Eight feet. One broken egg on ice. Five feet. THAT'S TOO CLOSE!! I arched my back and hissed. Fred dropped the broom and jumped back ten feet. Seizing the opportunity, I swiped the bag of marshmallows off the picnic table and dashed into the woods.

In the safety of the brush I eyed my prize. I had grabbed the wrong end of the bag and half of the marshmallows had escaped. But that didn't stop me from enjoying the rest and doing a little bit of reflecting.

With no pets allowed in the state campgrounds, we have the place to ourselves. Easy pickings. Campsites, trash c[illegible]s, dumpsters, and even a ranger's garden. Nothing to it.

But some raccoons get carried away. One glutton ate half of a styrofoam cooler after devouring its contents. Suffered a terminal case of indigestion.

Another raccoon gnawed a cork out of a bottle and quenched his thirst. Moments later he was wobbling around and tripped over a tent guy line. Come to think of it, I never saw him again after that night.

Well I don't want to keep you from doing what you were doing. Besides, the sun's getting ready to rise. It's high time I crawled up my tree and holed up a spell. ■

DEP Citizens' Bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

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